SM223AC Flash F/W & ISP Release Information – H0613

Introduction
This purpose of this document is to provide release information on the SM22X family F/W and ISP release information

Fix Coverage

■ stands for the **"new fix"** or **"new support"** in the category
☐ stands for the **"no-update"** in the category

■ **Tester FW**	■ **Controller ISP**
☐ **Yield Issue**	☐ **Yield Issue**
■ **Flash Issue**	■ **Flash Issue**
■ SLC Flash	■ SLC Flash
☐ Samsung Flash	☐ Samsung Flash
☐ Hynix Flash	☐ Hynix Flash
☐ ST Flash	☐ ST Flash
☐ Toshiba Flash	☐ Toshiba Flash
☐ Micron Flash	☐ Micron Flash
☐ Others	☐ Others
■ MLC Flash	■ MLC Flash
☐ Samsung Flash	☐ Samsung Flash
☐ Hynix Flash	☐ Hynix Flash
☐ ST Flash	☐ ST Flash
☐ Toshiba Flash	☐ Toshiba Flash
☐ Micron Flash	☐ Micron Flash
☐ Others	☐ Other
☐ **Compatibility issue**	☐ **Compatibility issue**
☐ CF card	☐ CF card
☐ IDE	☐ IDE
	☐ TestMatrix, PCTest and other tools.
☐ **Tester Bug Fix**	■ **ISP Bug Fix**
☐ **AP Bug Fix & New Function**	☐ **Card Size Adjustment**
☐ **Card Size Adjustment**	■ **Feature Enhance**
☐ **Feature Enhance**	

ISP Revision History

Version	Solo Tester version	ISP version	Note
H0613	**TESTER-223AC-H0613**	**ISP-223AC-H0613**	**1. For 2K page flash, the older firmware used copy back between even address page and odd address page. According to NAND flash spec, it is prohibited to operate copy back program from/to odd address pages to/from even address pages.** **2. Re-try random read to when ECC fail happened on copy back with random in/out to use higher clock frequency on Micorn & Intel 4K flash.** **3. Support Toshiba 56nm 4KB SLC** **4. Reserve more blocks as the new firmware that improves random write performance needs more temporary blocks.** **5. Check the voltage level of VDT to reset flash when flash is busy and voltage drops in write command. The process can improve power cycling.** **6. H0308 and H0415 firmware recover the old data on the block with correctable ECC errors. It makes the data inconsistent after power on/off.**
H0415	TESTER-223AC-H0415	ISP-223AC-H0415	1. Improve 4KB sequential write performance by removing redundant data move between different NAND on different chip enables. 2. Improve power cycling by add voltage level detection before data programming and erase.
H0308	TESTER-223AC-H0308	ISP-223AC-H0308	1. Improve random write performance on SLC and MLC. 2. Add one more ISP duplication block to prevent ISP corruption 3. Re-try to read ECC fail block for 3 times to ensure ECC fail 4. Support Hynix 47nm MLC 5. Update Chorus to 1.22.86
H0128	TESTER-223AC-H0117	ISP-223AC-H0128	1. Improve the power cycling.
H0116	TESTER-223AC-H0116	ISP-223AC-H0108	1. Fix the error to use copy back to move ECC fail block on Samsung 4KB flash. 2. Improve power cycling scheme. 3. Enhance wear leveling to have more convergent program/erase count distribution 4. To fix DOS character display issue by filling in

			the proper value in MBR 5. Support Flush cache command 6. Update flash data base to H0121 7. Update Chorus version to V1.22.82
G1207	TESTER-223AC-G1206	ISP-223AC-G1207	1. To support Hynix 57nm SLC, it failed because one extra ALE was asserted in B channel 2. Fix a coding error to with NOP=1 firmware that caused miss-marking the bad blocks. 3. Improve the wear leveling. 4. Support ATA security command set 5. To improve 4KB flash performance by not reading out copy back data.
G1017	TESTER-223AC-G1017	ISP-223AC-G1016	Support 2KB flash and Samsung 51nm SLC/MLC 1. Fix the error to miss-use copy back to move ECC fail block data. 2. Fix the error on wear leveling to cause performance drop and longer OS installation time.
G0831	TESTERDB-223AC-G0831	ISPDB-223AC-G0831	In the same firmware, in addition to support 2KB flash, also support Samsung 51nm SLC/MLC 1. To support Samsung 51nm SLC K9F8G, K9KAG, K9WBG and K9NCG 2. To support Samsung 51nm MLC K9GAG, K9LBG, K9HCG and K9MDG
G0831	TESTERDB-223AC-G0831	ISPDB-223AC-G0831	1. Add checking power voltage before read/write procedure. 2. Fine tune moving block performance (random write & device compatibility concern). 3. Support S.M.A.R.T. command. 5. Support wear-leveling algorithm. 6. Fix read ECC fail function bug. 7. Solve Read Link Table (function to build physical to logical block mapping) bugs. 8. Check child end page ECC fail (prevent sudden power-off cause ECC fail). 9. Solving the uP stack overflow issue. 10. Add function of ISP Block protection. 11. Solving PCMCIA-Memory mode & UDMA mode

			protocol bugs, ID table report. 12. To fix K9F1208C support issue. 13. To fix capacity error while SSD capacity is over 8GB 14. Use flash database and fix Hynix SLC clock setting errors. 15. To fix ATACT test fail
G0828	TESTERDB-223AC-G0817	ISPDB-223AC-G0818	The firmware only support Samsung 4KB SLC/MLC NAND Update Chorus from 1.22.45 to 1.22.47: 1. To fix the error of “Auto Test” function.
G0818	TESTERDB-223AC-G0817	ISPDB-223AC-G0818	The firmware only support Samsung 4KB SLC/MLC NAND 1. To support Samsung 51nm SLC K9F8G, K9KAG, K9WBG and K9NCG 2. To support Samsung 51nm MLC K9GAG, K9LBG, K9HCG and K9MDG 3. To use database format for flash function and clock setting 4. Add SMI enhanced wear leveling
G0522	TESTER-223AC-G0522	ISP-223AC-G0510	The first firmware package release of SM223AC . The firmware has passed DSC and card reader compatibility tests in SMI Lab (SM223AC w/ MLC). 1. Modify Two plane copy back to solve MLC time out issue. 2. To disable auto trigger mode while sector transfer is interrupted. It is used to fix the error of 0xEC (Identify) command after an reset was set within data transfer.
G0419	TESTER-223AC-G0418	ISP-223AC-G0413	The first firmware package release of SM223AC. The firmware has passed DSC and card reader compatibility tests in SMI Lab (SM223AC w/ SLC).

Note:

1. F/W and ISP update is recommended.
2. History # is denoted by “Version-Date” .

Firmware Release Note (H0613)

Solo Firmware's Information

Firmware Revision	Checksum
TESTER-223AC-H0610	005E17D4
ISP-223AC-H0415	017EB2CB

1 **Known Issues: N/A**

1-1.

Intel/Micron 50nm 8Gb SLC can not run under 25ns access time. The access time is around 29ns as 25ns failed on copy back with random in/out.

Tester Error Message Description

Item	Error Message	Description	Problem Category (controller or Flash)
1	**Initial Fail**	CF Initial process fail	Controller or bus error
2			
3	**Card Size Err**	The card size is different from the setting value in menu.	Mixed materials or Flash error
4	**Flash ASM Err**	Testing result is different from the setting value in menu about "**Set Flash CFG**". There are no flash connect to the controller, or the connect fail.	Setup error 或 Flash error
5	**Flash OverErr**	Read Flash ID command Get Number of Flash more than Set Flash CFG	Setup Error or Flash Error
6	**RAM Diag Err**	Controller Self Test RAM error	Controller Fail or Power issue
7	**ROM Diag Err**	Controller Self Test ROM error	Controller Fail or Power Issue
8	**Pretest Error**	The Flash has too much error.	Flash error
9	**NA**	NA	NA
10	**NA**	NA	NA
11	**ISP Code Error**	Tester Write ISP coed to Card and Read Back Compare Fail	Flash Error
12	**NewCIS_ID Err**	Tester Write CIS and ID table and Card Option to Card and verify	Flash Error
13	**NA**	NA	NA
14	**CIS_ID Err**	Tester Read CIS Error	Flash Error
15	**ReInitial Err**	Power on test. After power on, ReInitial the card.	Controller error
16	**ID TABLE Err**	Tester Read ID Table Error	Flash Error
17	**Chk QFmt Err**	The data in user data area is error.	Flash error
18	**Card Short**	Card Short	Maybe VCC and GND are short
19	**Run Mode Fail**	The ISP code is not execute correctly	Controller or Flash error
20	**Time Out**	Command time out.	Controller or Flash error
21	**H/W Ver. Err**	Card's controller does not match test firmware version	Please confirm the test firmware version
22	**Setting Err**	Running test on location F	Please switch to original test place
23	**Tst Chksum Err**	Tester firmware has error	Please re-download the test firmware
24	**ISP Cksum Err**	ISP code in tester has error	Please re-download the ISP code
25			
26	**No Card**	Card detect fail	Please plug-in card again
27	**Tester flash error**	Fixture flash error	Please configure flash
28	**Password Error**	Configure fixture flash password error	Please key-in correct password
29	**Tester Program error**	Fixture hasn't the test program	Please download test program
30	**Serial Number error**	S/N doesn't match the Card	
31	**Flash Maker ID error**	The flash maker ID is different from the setting value	Mixed materials
32	**NA**	NA	NA
33	**NA**	NA	NA
34	**NA**	NA	NA
35	**Copy Compare error**	Copy compare error	Flash error
36	**Preload file error**	Preload file to card	File system error
37	**NA**	NA	NA
38	**NA**	NA	NA
39	**Erase Error**	Erase flash	Flash error
40	**File system error**	File system error	File system error

PS: Every error maybe happened with card connection issue.